

DEPARTMENT OF LICENSES AND INSPECTIONS <b>CODE BULLETIN OF INFORMATION</b> <b>No. 1001</b>		CODE OF GENERAL ORDINANCES OF THE CITY OF PHILADELPHIA <hr/> TITLE 4 – BUILDING CONSTRUCTION AND OCCUPANCY CODE
SUBJECT OF BULLETIN: RESIDENTIAL FIRE SPRINKLER SYSTEMS: WATER SUPPLY INSTALLATION REQUIREMENTS		REFERENCE CODE SECTION(S): IRC – R313, P2904
ISSUED BY		
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**PURPOSE**

The purpose of this Code Bulletin is to establish criteria for installation of water services for residential fire sprinkler systems in R-3 Residential Occupancy Classifications and residential buildings constructed under the International Residential Code.

**BACKGROUND**

On September 21, 2008 the International Code Council (ICC) adopted amendment RB64-07/08 to the 2009 International Residential Code (IRC). This amendment mandates that all new one and two family residential dwellings along with townhomes be equipped with residential fire sprinkler systems (RFSS). On December 31, 2009, per the Pennsylvania Uniform Construction Code (UCC), all jurisdictions in Pennsylvania adopted the IRC and its RFSS requirements. In addition to its own prescriptive requirements in Section 2904, the IRC authorizes installation of these systems per the 13D Standard for RFSS established by the National Fire Protection Association (NFPA). In Pennsylvania, the provisions of the IRC for townhomes became effective on January 1, 2010 with an effective date for one and two family dwellings effective on January 1, 2011. The International Building Code requires all new residential occupancy buildings to have fire sprinkler systems.

While commonly used in commercial and industrial buildings for over a century, fire suppression systems have been uncommon in small residential buildings. RFSS are designed primarily as a life safety system, with water suppression activated upon the emergence of a fire. The suppression serves to provide critical time for building occupants to flee the premises before a large fire can erupt. The 2009 IRC code change represents a significant expansion of automated fire protection systems. The configuration of the RFSS water supply system employed in Philadelphia differs from the traditional systems supplying commercial and industrial buildings. Over time, the number of RFSS could grow to exceed the number of fire suppression systems existing in commercial and industrial buildings.

The Codes do not establish requirements for the actual supply of water to a building, only that potable water is to be supplied in the amounts and pressures specified. The authority for the supply of water to a building is the Philadelphia Water Department (PWD). PWD issues separate permits for connections to water mains and issues water meters. PWD also has responsibility for protection of their potable water supply.

PWD has developed new requirements for supplying water for both domestic use and RFSS to newly constructed residential buildings to reduce the costs associated with separate fire services while maintaining protection of the public potable water supply. This bulletin serves to document these new requirements for both contractors and code officials.

## **POLICY**

### **A. Water Supply Piping Configuration from Water Main to Building**

A single water supply line from a ferrule connection to the water main must be used to supply both domestic and fire water to the residential building. This is part of a multipurpose system and is acceptable in the NFPA 13D Standard and the IRC Section 2904 prescriptive requirements. The minimum size is ¾-inch piping and the maximum size is 2-inch. A separate and distinct water supply line for fire service only is not permitted in these residential settings for sizes ¾-inch up to and including 2-inch.

### **B. Domestic Plumbing and Fire Sprinkler Piping Configuration Inside the Building**

Upon entering the building, the water supply piping may branch to separate fire and domestic water supply lines, or be comingled as a network system whereby domestic water using fixtures and fire sprinkler heads are supplied from the same piping, as shown in Annex A of the NFPA 13D Standard.

### **C. Metering**

An Underwriters Laboratories (UL) listed residential fire meter will be provided on the single water supply line to buildings with a RFSS. The meter shall be installed upstream of any branching of domestic water supply lines and fire protection lines. PWD will provide the water meter which can range in the following sizes: ¾-inch, 1-inch, 1-1/2-inch, 2-inch. Piping, valving and appurtenances for the meter installation (i.e. the meter “set”) shall be configured and installed to adhere to existing water regulations that require proper spacing for the water meter and valving to allow servicing of the meter.

### **D. Permitting**

Permits from PWD are required to install a water supply service (to the curb stop), water meter, and to establish a customer billing account for a residential fire sprinkler service. The permit notes that a RFSS is being installed. A plumbing permit from the Department of Licenses and Inspections (L & I) is also required for water distribution from the curb stop to the building. It is recommended that the contractor, developer or construction manager ensure that a building permit for the residential fire sprinkler installation is approved prior to application for the water supply service and water distribution permits from PWD and L & I. This will serve to ensure the size of the water supply service line will be adequate to serve the domestic and fire sprinkler demands of the new building. The service line indicated on the PWD and L & I permits must be the same size as that indicated in the building permit for the fire sprinkler installation.

### **E. Water Quality Protection for the Water Distribution System**

Water quality in deadend piping in buildings may degrade due to stagnation. Degraded water poses a risk of entering the PWD water distribution system should a backflow or backsiphonage event occur. The best safeguards against these possibilities are to limit the opportunity for stagnant water within building piping systems. The following applies to the two general building piping configurations that are defined in NFPA 13D, or in the IRC Section P2904:

- a) For network piping systems which comingled domestic water piping and fire sprinkler piping, adequate circulation should exist and no water quality protection is necessary.
- b) For piping configurations using separate domestic and fire supply lines within the building premises, water in a deadend fire line encounters the opportunity to stagnate since fire sprinkler activation will occur rarely. If the builder pursues the option of supplying water via a separate fire supply line, the builder shall install an additional water supply line from a sprinkler head to the toilet tank that is most remote from the front entry of the building. The additional line will provide water to flush this toilet from the fire system piping in order to

periodically move water through the fire line and avoid stagnation of the water. The builder must affix a permanent sign to the RFSS piping noting that the supply line supplies water to a particular toilet. This sign should not be removed.

Backflow preventers shall not be used in RFSS installations unless required by PWD. The use of additives, such as antifreeze chemicals, in dedicated fire sprinkler lines requires the use of a permitted backflow preventer, approved by PWD.

#### **F. Sprinkler Piping Materials**

Installers of residential fire system piping and premise plumbing shall follow current City of Philadelphia codes and regulations regarding allowable piping materials for both underground customer piping from the water main connection in the street to the building premises; and piping for plumbing systems and RFSS inside of residential buildings.

#### **G. Shutoff Valves**

No valves are permitted on stand-alone fire sprinkler lines within the building premises. In such case, provide a shutoff valve on the separate domestic line within the building premises and downstream of the point where the fire line branches. Valves that shut off both the domestic water and fire sprinklers at the same time are permitted.

#### **H. Installation**

Installation work shall be carried out by registered master plumbers for service line piping, meter box and internal plumbing to supply domestic fixtures; and by a licensed fire suppression company for fire sprinkler piping, sprinkler heads, and related piping/appurtenances.

#### **I. Inspection of Newly Installed Residential Fire Sprinkler Systems**

The RFSS must be tested by a licensed fire suppression company in order to be commissioned into active service. The installer of a NFPA 13D or IRC Section P2904 designed RFSS shall attach a tag at the service entrance which provides instructions for the homeowner on maintenance of the system. The tag shall indicate the name of the licensed fire suppression company responsible for the installation and the date the system was tested and placed into active service. This tag will serve in lieu of a sprinkler system certification (acceptance test) which is required for NFPA 13 and 13R systems. Those NFPA 13R systems installed on one- or two family dwellings may also utilize a tag.

#### **J. Routine Maintenance and Testing**

The fire suppression contractor must supply manuals to the homeowner. The burden for maintenance and testing of the RFSS falls upon the property owner. RFSS must be functional and in working condition at all times.

#### **K. Shutoff Policy & Notification**

PWD executes water service termination in accordance with the Residential Customer Service Regulations for water supply in the City of Philadelphia. Shutoff is executed at the curbstop on the multipurpose line supplying both domestic water supply and fire protection. Customers are provided multiple advance notices that shutoff action will be undertaken. Shutoff is a last resort action taken after multiple attempts to address longstanding payment delinquency or other significant violation on the part of the property owner/rate payer.

#### **L. Billing Documentation**

All water services are permitted and activated in the PWD Customer Billing System. The meter number is tracked and this will be used by PWD to identify systems as RFSS.